RIVERBANK ACOUSTICAL LABORATORIES
OF
IIT RESEARCH INSTITUTE
1512 BATAVIA AVENUE
GENEVA, ILLINOIS 60134
708/232-0104
FOUNDED 1918 BY
WALLACE CLEMENT SABINE

REPORT

FOR: Dietrich Industries, Inc.

Sound Transmission Loss
Test RAL™-TL92-41

ON: Shaftwall 2

CONDUCTED: 29 January 1992

TEST METHOD

Unless otherwise designated, the measurements reported below were made with all facilities and procedures in explicit conformity with the ASTM Designations E90-90 and E413-87, as well as other pertinent standards. Riverbank Acoustical Laboratories has been accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) for this test procedure. A description of the measuring technique is available separately. The microphone used was a Bruel & Kjaer serial number 792729.

DESCRIPTION OF THE SPECIMEN

The test specimen was designated as Shaftwall 2. The overall dimensions of the specimen as measured were 4.27 m (168 in.) wide by 2.74 m (108 in.) high and 88.9 mm (3.5 in.) thick. The specimen was constructed by Klamer Construction Company directly into the laboratory's 2.74 m (9 ft) by 4.27 m (14 ft) wood-lined steel frame. The description of the specimen was as follows: The specimen was a shaftwall assembly constructed of 63.5 mm (2.5 in.) steel C-T studs with one layer of 25.4 mm (1 in.) thick gypsum wallboard liner panels on the source side and two layers of 12.7 mm (0.5 in.) thick Firecode C drywall on the receiving side. Mineral wool insulation filled the stud cavities. A visual inspection verified the description of the specimen. The specimen was cured for a minimum of twelve hours before testing. The source and receiving room temperatures at the time of the test were 18°C (65±2°F) and 60±2% relative humidity.

Floor and Ceiling Runners

The runners were 25 ga. steel "J" shaped, 63.5 mm (2.5 in.) wide with unequal legs of 25.4 mm (1 in.) and 57.2 mm (2.25 in.). The "J" runners were manufactured by Dietrich Industries, Inc. The runners were positioned with the short leg toward the receiving room. The runners were attached to the floor and ceiling (top and bottom of the test frame) with 41.3 mm (1.625 in.) type S drywall screws, 0.61 m (24 in.) on center. The end screws were located 50.8 mm (2 in.) from each end. A 3.05 m (120 in.) piece plus a 1.22 m (48 in.) piece was used at both the ceiling and the floor. Runners, cut 2.74 m (108 in.) long, were also used at each end of the wall. The total used was 14.0 m (46 ft). The weight of the "J" runners used was 9.1 kg (20 lbs).

DESCRIPTION OF THE SPECIMEN (con't)

Steel Studs

The steel studs were 63.5 mm (2.5 in.), 25 ga. steel C-T studs 38.1 mm (1.5 in.) wide by 63.5 mm (2.5 in.) deep. The C-T studs were manufactured by Dietrich Industries, Inc. The studs were cut to lengths 19.1 mm (0.75 in.) less than the floor-to-ceiling height and spaced 0.61 m (24 in.) on center. The studs were cut to 2.72 m (107.25 in.) long. Studs were friction fit into the floor and ceiling "J" runners. Six studs were used, and the weight was 11.6 kg (25.5 lbs).

Gypsum Liner Panels

The gypsum liner panels were 25.4 mm (1 in.) thick gypsum wallboard liner panels (USG type SLX) supplied in nominal 0.61 m (24 in.) widths. The liner panels were cut 25.4 mm (1 in.) less than the floor-to-ceiling height. The vertical edges were inserted into the "T" section of the C-T studs (friction fit). The gypsum liner panels were cut to 2.72 m (107 in.) long. The weight of the gypsum liner panels used was 235.2 kg (518.5 lbs).

Perimeter Caulking

The perimeter caulking was USG Acoustical Sealant. It was used to caulk the perimeter "J" runners to the test frame. The weight of the acoustical caulk was 4.5 kg (10 lbs).

Insulation

Mineral wool insulation (Thermafiber SAB) manufactured by USG completely filled the stud cavities. The insulation was supplied in batts 38.1 mm (1.5 in.) thick, 0.61 m (24 in.) wide, and 1.22 m (48 in.) long. The weight of the mineral wool insulation used was 22.9 kg (50.5 lbs).

Wallboard Gypsum

The wallboard gypsum was 12.7 mm (0.5 in.) thick USG type X Firecode C drywall. Pieces that were 1.22 m (48 in.) wide were applied in two layers to the face of the "C" shaped section of the C-T studs (same side as the short leg of the "J" runner). The base layer was applied horizontally. The face

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DESCRIPTION OF THE SPECIMEN (con't)

Wallboard Gypsum (con't)

layer was applied vertically. The inner or base layer was attached to the studs with 25.4 mm (1 in.) long type S bugle head drywall screws spaced 0.61 m (24 in.) on center along the edges and in the field of the boards with the first screw 76.2 mm (3 in.) from the end. The outer or face layer was attached to the studs with 41.3 mm (1.625 in.) type S bugle head drywall screws 0.30 m (12 in.) on center along the edges and in the field of the board with the first screw 152 mm (6 in.) from the end. The outer layer screws were staggered from the inner layer screws. The weight of the drywall used was 229 kg (504 lbs).

Gypsum Perimeter Caulking

All the 12.7 mm (0.5 in.) gypsum board was installed with an approximately 6.4 mm (0.25 in.) space between the gypsum board and the test frame perimeter. The space between the 12.7 mm (0.5 in.) gypsum board and the test frame was caulked with USG Acoustical Sealant. The weight of the acoustical sealant was 6.8 kg (15 lbs).

Joint Compound and Paper Tape

The outer layer of 12.7 mm (0.5 in.) gypsum board joints were covered with joint tape and USG All Purpose Joint Compound. The exposed screw heads were covered with joint compound. The weight of the joint compound when wet was 7.3 kg (16 lbs).

Perimeter of Test Assembly

The perimeter of the completed test assembly (both sides) was sealed with Mortite dense mastic.

Weight/Area

The weight of the specimen as determined was 526 kg (1159.5 lbs) an average of 45.0 kg/m^2 (9.2 lbs/ft^2). The transmission area used in the calculations was 11.7 m^2 (126 ft^2).

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TEST RESULTS

Sound transmission loss values are tabulated at the eighteen standard frequencies. A graphic presentation of the data and additional information appear on the following pages. The precision of the TL test data are within the limits set by the ASTM Standard E90-90.

FREQ.	T.L.	C.L.	DEF.	FREQ.	T.L.	C.L.	DEF.
100	15	0.28	0	800	56	0.36	0
125	20	0.32	8	1000	58	0.33	0
160	29	0.37	2	1250	59	0.29	0
200	38	0.43	0	1600	59	0.25	0
250	42	0.35	0	2000	59	0.21	0
315	45	0.43	0	2500	57	0.16	0
400	51	0.48	0	3150	58	0.18	0
500	54	0.45	0	4000	60	0.15	0
630	55	0.46	0	5000	63	0.14	0

STC = 44

ABBREVIATION INDEX

FREQ. = FREQUENCY, HERTZ, (cps)
T.L. = TRANSMISSION LOSS, dB
C.L. = UNCERTAINTY IN dB, FOR A 95% CONFIDENCE LIMIT
DEF. = DEFICIENCIES, dB<STC CONTOUR
STC = SOUND TRANSMISSION CLASS

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